A68.E636
JACC March 9, 2010
Volume 55, issue 10A

IMAGING AND DIAGNOSTIC TESTING

IMAGE QUALITY AND RADIATION EXPOSURE OF LOW-DOSE PROTOCOLS FOR CORONARY CT ANGIOGRAPHY: COMPARISON OF PROSPECTIVE AXIAL SCANNING AND HIGH-PITCH SPIRAL ACQUISITION

ACC Poster Contributions
Georgia World Congress Center, Hall B5
Sunday, March 14, 2010, 9:30 a.m.-10:30 a.m.

Session Title: Radiation Exposure with CT Coronary Angiography
Abstract Category: CT Coronary Angiography
Presentation Number: 1034-200

Authors: *Stephan Achenbach, Martin Seltmann, Tobias Pflederer, Mohamed Marwan, Dieter Ropers, Michael Lell, Katharina Anders, Axel Kuettner, Michael Uder, Werner G. Daniel, Department of Cardiology, University of Erlangen, Erlangen, Germany, Department of Radiology, University of Erlangen, Erlangen, Germany*

We prospectively compared two low-dose image acquisition protocols for coronary CT angiography (CCTA), prospectively ECG triggered, axial scanning ("step and shoot") versus high-pitch spiral acquisition in 100 consecutive patients in a randomized trial.

Methods: 100 consecutive patients referred to CCTA for suspected coronary artery disease were randomized to prospectively ECG triggered axial acquisition or high-pitch spiral acquisition. All patients had to be in sinus rhythm with a heart rate <= 60/min and had to have a body weight < 100 kg. CT was performed using Dual Source CT with .28s gantry rotation, 2x128 slices, 100 kV and 320 mAs. For high-pitch spiral acquisition, a pitch of 3.4 was used and image acquisition was completed in approximately 250 ms, triggered at 60% of the R-R interval. Prospectively ECG gated axial images were acquired at 70% of the R-R interval. Temporal resolution was 75 ms for both scan modes. Image quality was rated per segment (1= perfect to 4= unevaluable).

Results: Mean age was 57±13 years, weight was 72±14 kg and heart rate was 53.9±5 beats/min (p = n.s. between groups). DLP was 106±25 cm*cGy for axial versus 58±3 cm*cGy for high pitch spiral acquisition, corresponding to average effective doses of 1.5 and 0.8 mSv (p < 0.001). For axial acquisition, image quality score was "1" in 612/693 segments (88%), "2" in 63 segments (10%), "3" in 12 segments (2%) and "4" in 6 segments (0.9%). For high pitch spiral acquisition, image quality was "1" in 633/670 segments (94%), "2" in 25 segments (4%); "3" in 8 segments (1%) and "4" in 4 segments (0.6%). Mean image quality score per patient was 1.2±0.2 for axial and 1.1±0.1 for high pitch spiral acquisition (p = n.s.).

Conclusion: Prospectively ECG triggered axial and high pitch spiral acquisition allow coronary CT angiography with very low doses and equally high image quality in selected patients. Radiation exposure is significantly lower for high pitch spiral CT.